

Review of Science Standards Final Draft by Nancy Z. Hartung

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I have done a brief review of the second draft of the Minnesota Academic Standards in Science at the request of Dr. Susan Chaplin. Dr. Chaplin is out of the country and unable to review these revised standards at this time.

My comments are in broad terms, and echo those Dr. Chaplin submitted in response to the first draft. My main concern is about the lack of attention to the ability of students to find relevant information, evaluate that information, analyze and solve problems, transfer knowledge gained in one area to use in another context, etc. The standards still largely address (1) content, with performance too often in terms of “describe” and “explain”; and (2) the scientific method *per se*. Only occasionally are students asked to seek out and/or apply scientific knowledge to real world situations – skills all people will increasingly have to use in their lives. While a core base of knowledge in science is certainly important, if people are unable to use that knowledge to learn more, to ask good questions, to problem solve, that core knowledge will be largely irrelevant. To maintain that any particular body of knowledge taught in K-12 will be sufficient for a scientifically literate person in today’s world is basically untenable. The ability to continue learning, to find and evaluate new information, to integrate and apply information to concrete problems is also important. Indeed it may be that with the explosively increasing availability of information via technology, it is even more critical to emphasize those skills than to assure that particular items of information are known.

Additionally, I agree with Dr. Chaplin that unless the way in which students learn the “facts” of science is one in which they must actively construct their own knowledge, little will be learned that will last and be usable. This again speaks to the way in which science is learned by our students as critical.

We need to develop people who are curious, view scientific information as relevant to their daily lives, are empowered to locate and evaluate information, ask good questions, work together to develop solutions, are enabled to learn more as needed.

I realize that individual classroom teachers may well utilize the types of cases, problems and other active learning methodologies that develop such abilities, but unless that type of approach, and the related student outcomes, are valued by inclusion in the standards, the importance of such ability for all students will not be adequately recognized, evaluated, and developed.